

# *Field Report*

## Carlsbad Caverns National Park

### ■ 1.0 Summary

#### Natural Entrance to Bat Cave and Main Corridor



Carlsbad Caverns National Park, in southeastern New Mexico, is known for its spectacular limestone caves. Carlsbad Cavern and Lechuguilla Cave in particular are notable for their immense sizes and their high degree of decoration.

The Park has two units. The main unit extends for about 21 miles southwestward along the Capitan Reef. It varies in width from about three to six miles. The cavern that gives the Park its name and most Park development are in the eastern portion of this unit, on top of the reef or escarpment. Stretching for miles to the west is the backcountry, which includes the escarpment and several deeply cut and spectacular canyons. The separate Rattlesnake Springs unit contains about 80 acres and lies seven miles southwest of the Park entrance. Rattlesnake Springs is the source of the Park's water supply. The two units of the Park contain a total 46,766 acres.

Service facilities including the Visitor Center, administrative offices, maintenance facilities, residences, and visitor parking lots are located on the surface, above the main cavern. Runoff from the surface area, including numerous pollutants harmful to the cave features, follows cracks and fissures through the ground to enter the caverns. The NPS is investigating alternatives to reduce the harmful composition of water entering the caves that potentially include relocating parking areas and visitor service activities to the base of the escarpment. As a result of the NPS investigations, potential Alternative Transportation Systems (ATS) needs have been identified for this site as follows:

- One Park alternative would move visitor parking, the maintenance facility, and housing from the top to the bottom of the escarpment. A point-to-point shuttle using buses with detachable trailers would transport visitors and employees between the bottom of the escarpment and the Visitor Center area at the top of the escarpment during all hours of Park operation throughout the year. Use of the system would be mandatory for all visitors and employees.
- Another Park alternative would provide off-site overflow parking off the escarpment. A point-to-point shuttle using vans would transport visitors and employees between the bottom of the escarpment and the Visitor Center area at the top of the escarpment. The system would run during all hours of Park operation during all days in July, during weekends in June and August, and Memorial Day and Labor Day weekends. Use of the system would be voluntary for visitors and employees.

## ■ 2.0 Background Information

### 2.1 Location

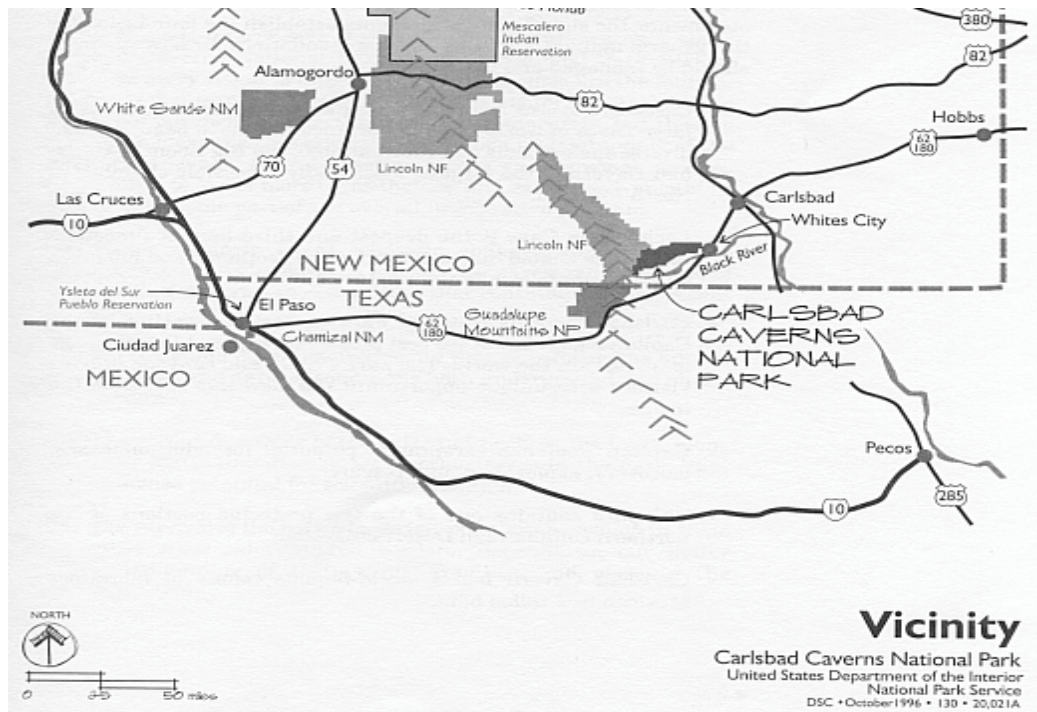
The Park is about 20 miles southwest of Carlsbad, New Mexico, and 150 miles from El Paso, Texas and Ciudad Juarez, Mexico. Other major metropolitan areas within a day's drive of the Park include Albuquerque and Santa Fe, New Mexico, and Amarillo, Texas. Visitors arrive by way of U.S. Highway 62/180 and enter the Park at its far east end near White's City, at the bottom of the Guadalupe escarpment (see Figure 1). They then travel westward along the scenic seven-mile entrance road to the Visitor Center/cavern entrance area on top of the escarpment. Most visitors arrive in private vehicles, but some visit with school groups or bus tours.

### 2.2 Administration and Classification

Carlsbad Caverns National Park was first proclaimed as Carlsbad Cave National Monument in 1923. In 1930 the name was changed, the boundaries were enlarged, and the monument was changed to a National Park by congressional designation. The Park Superintendent is Frank J. Deckert.

### 2.3 Physical Description

Elevations within the Park rise from 3,596 feet in the lowlands to 6,368 feet on the escarpment. About 71 percent of the Park (33,125 acres) has been designated as wilderness because of outstanding opportunities for solitude and primitive recreation. These lands are managed according to the provisions of the Wilderness Act and the NPS policies on wilderness.

**Figure 1. Regional Map**

Carlsbad Caverns National Park and the surrounding region are comprised primarily of spacious desert areas. The Park preserves one of the few protected portions of the northern Chihuahuan Desert ecosystem. From deeply incised uplands within the Park, the land slopes into plains and low hills to the south and east, and then gradually rises toward the southwest to form the crest of the rugged Guadalupe Mountains of northwestern Texas.

## 2.4 Mission and Goals of the National Park

The purpose statements for Carlsbad Caverns National Park were initially identified in the legislation that established the Park and in subsequent supporting documentation. The Park's General Management Plan (GMP) includes the following purpose statements to provide the foundation for determining what is appropriate for the Park:

- Preserve and protect cave resources, the Chihuahuan Desert ecosystem, and the Capitan Reef in Carlsbad Caverns National Park, as well as associated natural and cultural resources;
- Provide a range of opportunities for public use, enjoyment, and understanding, while minimizing impacts on Park resources and natural processes; and
- Facilitate research to provide a continuum of information in support of Park interpretation and management decisions, and the general body of scientific knowledge.

## 2.5 Visitation Levels and Visitor Profile

Carlsbad Caverns National Park tracks visitation through a count of ticket sales to visit the cave (see Table 1). Annual visitation for the period 1979 through 1998 has ranged from a low of 524,074 in 1998 to a high of 794,367 recorded in 1989. The annual visitation started to decline in 1990 and has tracked down since 1993. The peak season for each year has been during June, July, and August with up to 43 percent of the annual visitation occurring during those summer months.

**Table 1. Carlsbad Caverns National Park Cave Visitation, by Year 1979-1998**

Year	Visitors	Average Monthly Visitation	High Visitation Month/ Number of Visitors		Low Visitation Month/ Number of Visitors	
1979	723,626	55,664	July	125,793	Jan	20,171
1980	773,776	59,521	July	124,927	Feb	21,939
1981	773,747	59,519	July	138,448	Feb	27,235
1982	781,309	60,253	July	151,344	Dec	23,329
1983	712,247	54,941	July	145,752	Dec	19,822
1984	712,989	54,998	July	143,066	Jan	19,331
1985	732,482	56,497	July	143,206	Jan	18,680
1986	752,552	58,041	July	140,615	Feb	23,188
1987	781,300	60,253	July	146,751	Dec	24,287
1988	786,135	60,625	July	152,161	Jan	23,401
1989	792,378	61,105	July	147,887	Jan	27,408
1990	747,016	57,616	July	138,906	Dec	20,450
1991	679,450	52,419	July	127,451	Jan	16,444
1992	688,742	53,133	July	128,374	Jan	22,793
1993	687,131	53,010	July	120,669	Jan	23,927
1994	617,087	47,622	July	110,499	Jan	21,816
1995	588,609	45,431	July	110,583	Jan	21,251
1996	557,217	43,016	July	99,269	Jan	18,131
1997	540,797	41,753	July	98,880	Jan	18,612
1998	522,076	40,313	July	93,149	Jan	19,947

Source: NPS, Public Use Statistics Office.

In addition to counting visitors to the caves through ticket sales, the Park counts attendance for the Bat Program that is held nightly in the amphitheater at the Natural Entrance to the main corridor (see Table 2). Mexican free-tail bats live in an area of Carlsbad Cavern separate from the main corridor from early spring through October. In a mass

exodus at dusk, thousands of bats fly from the cave for a night of feeding on insects. Before each flight a Park ranger gives a short talk on bats.

**Table 2. Carlsbad Cavern Bat Program Attendance, 1995-1998**

Year	May	June	July	August	September	October	Total
1995	10,623	22,413	23,713	18,081	9,676	8,649	95,150
1996	10,187	22,793	26,402	19,696	9,306	7,376	97,756
1997	9,407	21,547	24,863	19,001	7,465	6,168	90,448
1998	7,897	20,456	25,652	15,821	7,620	5,660	85,104
1999	6,272	20,750	26,100	14,000	7,651	*	76,772

\*Attendance for October, 1999 not available at time report prepared.

Source: Carlsbad Cavern National Park.

## ■ 3.0 Existing Conditions, Issues and Concerns

### 3.1 Transportation Conditions, Issues and Concerns

#### Highway Sign at White's City



Transportation conditions on U.S. 62/180 along Carlsbad Caverns National Park and on SH-7 between U.S. 62/180 and the Visitor Center generally are favorable. There is no congestion on these or other roadways. Parking conditions generally are favorable also. There is some concern expressed by local residents and businesses about the lack of paved

shoulders on U.S. 62/180 and the quality of its pavement. The lack of paved shoulders creates safety problems for bicyclists sharing the road with high-speed motorized vehicles. The Carlsbad Chamber of Commerce would like to see U.S. 62/180 widened to four lanes with paved shoulders between Carlsbad and El Paso. Currently, paved shoulders exist along the Texas portion only.

Parking spaces provided at the Carlsbad Caverns National Park Visitor Center area are shown in detail in the Table 3.

**Table 3. Carlsbad Caverns National Park Visitor Center Area Parking Spaces**

<b>Parking Area</b>	<b>Parking Spaces (11' x 16')</b>	<b>Motorcycle Spaces (size varies)</b>	<b>Handicapped Spaces (18' x 16')</b>	<b>Total</b>
Visitor Center South	389	10	9	408
	<b>Parking Spaces (14' x 16')</b>	<b>Spaces for Buses, RVs, etc. (20' x 16')</b>	<b>Handicapped Spaces (18' x 16')</b>	
Visitor Center West	229	41	6	276
Bat Flight	173	2	5	180
<b>Total</b>	<b>791</b>	<b>53</b>	<b>20</b>	<b>864</b>

Source: NPS.

There is one intercity bus trip per day along U.S. 62/180 between Carlsbad and El Paso provided by TNM&O. A bus station is located in Carlsbad. A stop is located in White City. A taxi service and a demand-responsive van service are provided within Carlsbad and are run by the City of Carlsbad. The city and the Carlsbad Chamber of Commerce are attempting to put together funding to provide fixed-route transit service within the city.

### 3.2 Community Development Conditions, Issues and Concerns

Carlsbad Caverns National Park and the city of Carlsbad are located in Eddy County, New Mexico. The state and federal governments own 80 percent of the land within the County. There are approximately 28,000 residents in Carlsbad, the county seat and largest city in Eddy County. The county's population is estimated at 52,000.

There are approximately 1,250 hotel and motel rooms in Carlsbad and Eddy County. The New Mexico Hotel and Motel Association reported that roughly 80 percent of the rooms in Carlsbad have been occupied during the summer months of June, July and August for the past four years. The local Chamber of Commerce states that tourists use approximately one-third of the rooms during the summer. The Chamber representatives also reported that business drops more than 50 percent during the winter months. There is a county-wide tax of five percent on all lodging that has recently raised approximately \$80,000 per year. The proceeds of the tax are allocated to Cave Country USA, a business

promotion organization, which uses the funds for advertising and promotion of the area through media outlets with national exposure.

Other major business operations and employers in the Carlsbad/Eddy County area are the federal Waste Isolation Pilot Plant, the potash mines, and oil and gas drilling and extraction.

### **View from Visitor Center Parking Lot Toward Bat Show Amphitheater**



### **3.3 Natural or Cultural Resource Conditions, Issues and Concerns**

The most significant resource in the Park is its caves. In accordance with the NPS policies and regulations, underground portions of the natural environment will be protected and preserved to ensure ecosystem integrity while providing for visitor enjoyment.

Carlsbad Cavern is one of the world's largest caverns by volume, and it is considered one of the most adorned with diverse speleotherms (cave decorations). From the natural entrance the paved trail drops about 830 feet through the Main Corridor into the King's Palace area. The trail inclines upward to the elevator area at approximately 750 feet below the Visitor Center.

The Big Room is one of the largest underground chambers in the world. The cross-shaped cavern measures 1,800 feet in length, up to 1,100 feet wide, and 255 feet at its highest point.

Cavern resources could be affected by the infiltration of contaminants from surface development. The Park's maintenance area, where paint, propane, gas, oil, epoxy, and other chemicals are stored, is just uphill from the natural entrance. A spill or fire could result in chemicals or chemical-laden water draining directly into the cavern.

Other facilities above the cavern include the Visitor Center, offices, housing, and sewer lines, along with parking lots that collect petroleum products from cars and buses.

Contaminants can be transported by air currents and water into the cave, potentially causing changes in cave formation processes or putting peoples' health at risk.

### Visitor Center Parking Area



## 3.4 Recreation Conditions, Issues and Concerns

Carlsbad Caverns National Park attracts and hosts between 500,000 and 600,000 visitors per year, with approximately 90 percent of the visitation activity occurring in and around Carlsbad Cavern. The other visitor use areas, primarily backcountry and wilderness area activities, are dispersed throughout the Park. Access to the other attractions and use areas is obtained primarily from Highway 62/180. Due to the dispersed nature of attractions other than the cavern/Visitor Center area, ATS are not considered feasible or appropriate.

## ■ 4.0 Planning and Coordination

### 4.1 Unit Plans

The GMP for Carlsbad Cavern National Park raises the prospect of an ATS to address the problem of infiltration of surface pollutants from the parking lots through the ground and into the caverns. The Denver Service Center of the NPS is working with staff from the Park to evaluate potential design and program solutions that would include ATS and affect the Visitor Center area of the Park. The DSC and Park staffs have participated in a “Choosing by Advantage” exercise to evaluate three alternatives in terms of how well the alternatives meet program objectives. The next step in the evaluation process will be to

compare the dollar costs associated with the alternatives. Following that exercise the DSC and Park staffs will combine the results of the two analyses to determine the preferred alternative.

## **4.2 Public and Agency Coordination**

The Park is working closely with community representatives from Eddy County, the City of Carlsbad, the Chamber of Commerce and the Convention and Visitors Bureau in evaluating impacts and alternatives related to moving visitor parking from the current location. The Park personnel are also involving representatives from the NPS Denver Service Center, and from the National Parks and Conservation Association Southwest Regional Office in these planning activities. Other coordination efforts involve:

- Jack White, Jr., owner of White's City regarding ATS and off-site parking; and
- Cavern Supply, Carlsbad Caverns National Park concessionaire, regarding terms of future concessionaire contracts, particularly potential for operation of a shuttle system from the base of the escarpment at the main Park entrance to the Visitor Center area.

## **■ 5.0 Assessment of Need**

### **5.1 Magnitude of Need**

There is no need for an ATS at Carlsbad Caverns National Park at this time. The potential for future ATS need is dependent on Park alternatives currently under development by the NPS. The three alternatives under consideration include:

- A. Change Land Use;
- B. Reduce Impacts; and
- C. Reduce Sources of Contamination.

Alternative A would move visitor parking, the maintenance facility, and housing from the top to the bottom of the escarpment. This alternative would require a substantial ATS investment. Alternative B would not substantially change land use and would not require an ATS investment. Alternative C would provide off-site overflow parking off the escarpment and would require a small ATS investment.

### **5.2 Feasible Alternatives**

Two ATS options are feasible, one for Park Alternative A and the other for Park Alternative C.

### ***Alternative A***

Under Park Alternative A, a point-to-point shuttle using buses with detachable trailers would transport visitors and employees between the bottom of the escarpment and the Visitor Center area at the top of the escarpment during all hours of Park operation throughout the year. Use of the system would be mandatory for all visitors and employees. The system is described below.

- Number of vehicles required: eight buses (assumes two spare vehicles).
- Capital cost if vehicles purchased by the NPS (1999 dollars): \$2,400,000 (vehicle costs only – does not include costs of bus maintenance and storage facilities, and parking lot facilities such as parking spaces and covered shelters).
- Annual operating and maintenance cost if vehicles owned by the NPS: \$450,000 (assumes an average of 10 operating hours/day, 364 days/year, \$31/hour, and an average of four vehicles operating at a time).
- Annual operating and maintenance cost if service contracted out: \$800,000 (assumes an average of 10 operating hours/day, 364 days/year, \$55/hour, and an average of four vehicles operating at a time).
- Vehicle intervals: five to 30 minutes depending on season and whether or not trailer is used.

### ***Alternative C***

Under Park Alternative C, a point-to-point shuttle using vans would transport visitors and employees between the bottom of the escarpment and the Visitor Center area at the top of the escarpment. The system would run during all hours of Park operation during all days in July, during weekends in June and August, and Memorial Day and Labor Day weekends. Use of the system would be voluntary for visitors and employees. The system is described below.

- Number of vehicles required: three vans (assumes one spare vehicle).
- Capital cost if vehicles purchased by the NPS (1999 dollars): \$150,000 (vehicle costs only – does not include costs of van maintenance and storage facilities, and parking lot facilities such as parking spaces and covered shelters).
- Annual operating and maintenance cost if vehicles owned by the NPS: \$35,000 (assumes \$31/hour and an average of 12 operating hours/day).
- Annual operating and maintenance cost if service contracted out: \$50,000 (assumes \$55/hour and an average of 12 operating hours/day).
- Vehicle intervals: 15 to 30 minutes depending on whether a July weekend or July weekday or other summer weekend.

## ■ 6.0 Bibliography

General Management Plan, Carlsbad Caverns National Park, October, 1996.

Alternative Transportation Modes Feasibility Study, Volume I, May 1994.

Site Visitation Records from the Public Use Statistics Office at  
<http://www2.nature.nps.gov/stats/index.htm>.

Choosing By Advantage materials from Workshop conducted September 8-9, 1999.

## ■ 7.0 Persons Interviewed

Aleta E. Knight, Management Assistant, Carlsbad Caverns National Park

Frank J. Deckert, Superintendent, Carlsbad Caverns National Park

Dale Pate, Cave Specialist, Carlsbad Caverns National Park

Mark Tabor, ASLA, National Park Service, Denver Service Center

Mark Pritchett, National Park Service, Denver Service Center

Dave Simon, Southwest Regional Director, National Parks and Conservation Association

Tracy A. Hill, Executive Director, Carlsbad Chamber of Commerce, Convention and Visitors Bureau

Jack White, Jr., President, White's City, Inc.

Frank W. Hodnett, President, The Cavern Supply Company, Inc.

Ray Camp, Commissioner, Eddy County

Steve Massey, County Manager, Eddy County

John Beasley, Community Development Director, City of Carlsbad